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provided. Accordingly, Applicant's Reply to Office Action is timely filed. Entry of the present Reply and reconsideration of the application is respectfully requested.

### **REMARKS**

Claims 1-25 are pending in the present application. Applicant and Applicant's undersigned attorney wish to thank the Examiner for the careful and thorough attention given to this application.

Applicant respectfully requests reconsideration of the rejections set forth in the Office Action mailed 16 April 2003. Applicant submits that the presently claimed invention patentably distinguishes over the prior art, and in particular distinguishes over the asserted combination of Stevenson and Izaki et al. set forth in the Office Action to which this paper is responsive. Applicant incorporates by reference the arguments and facts set forth in the previously submitted replies to Office Action in this application.

### **Responses to Examiner's Arguments and Rejections** **Based on Stevenson in view of Izaki et al.**

Claims 1-6 and 10-24 stand rejected as obvious over Stevenson, U.S. Patent No. 4,552,626, in view of Izaki et al., U.S. Patent No. 6,406,750 B1. Claims 7-8 stand rejected as obvious over Stevenson in view of Izaki et al. and further in view of Pendleton, U.S. Patent No. 5,110,355. Claim 9 stands rejected as obvious over Stevenson in view of Izaki et al. and further in view of Stamp et al., U.S. Patent No. 5,421,989. Applicant respectfully traverses the claim rejections for at least the following reasons, in addition to the reasons previously set forth, incorporated by reference herein.

### **Applicant's Examples Show the Criticality of the Claimed Range of pH**

Applicant's specification includes examples which show the significance, criticality and unexpectedness of the claimed pH range, particularly with respect to the prior art references cited and relied upon by the Examiner, and which Applicants respectfully submit overcome the Examiner's asserted *prima facie* obviousness.

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In the final Office Action, the Examiner asserted that, notwithstanding the distinctions between the present invention and the prior art, the claimed "aqueous solution or mixture containing a silver salt having a pH in the range from about 5 to about 10" would have been obvious over the asserted combination of references. Even if the Examiner has shown a *prima facie* case of obviousness (which Applicant continues to traverse, see *infra*), an applicant can overcome such *prima facie* obviousness by establishing that the claimed range is critical, by showing that the claimed range achieves unexpected results relative to the prior art range. *In re Geisler*, 43 USPQ2d 1362, 1365 (Fed. Cir. 1997).

In Applicant's specification, a number of examples are provided. Example 1 was carried out with an aqueous silver solution at pH ~8.0. Examples 2, 11 and 12 were carried out with an aqueous silver solution at pH ~6.5, and Example 9 was carried out with an aqueous silver solution at pH ~9.0, all of which are within the claimed range of pH about 5 to about 10. Comparative Example 1 is carried out with an aqueous silver solution at pH ~2.5, which is both outside the claimed range and within Applicant's definition of acidic, i.e., below pH 5. In these Examples, as claimed, silver is the activator and is used in the absence of palladium.

As shown in Applicant's Examples 1, 2, 9, 11 and 12, the substrates catalyzed with silver ion at a pH within the claimed range provide good uniform copper coverage when the silver catalyzed surface is electroless copper plated. In contrast, as shown in Comparative Example 1, when the substrate is attempted to be catalyzed by an acidic silver ion, at pH ~2.5 which is outside the claimed range but similar to the "acidic silver solution" in the prior art referred to in Applicant's specification, electroless copper plating coverage is poor and nonuniform on all test plaques.

Applicant's results would not have been expected from the teachings of the prior art (see *infra*). These results show there is a distinction between the claimed pH range and the acidic silver solutions used in the prior art. Clearly, Applicant's Examples provide unexpected results when compared to Applicant's Comparative Example 1. These results

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show that the distinction over the prior art discovered by the Applicant is real, meaningful and, most importantly, provide a patentable distinction over the prior art.

In the present application, Applicant has clearly defined the term "substantially neutral pH", that is, "a pH in the range from about 5 to about 10" and has defined the term "acidic, e.g., below about pH 5". Applicant has previously argued and has shown that, in the prior art, an "acidic" silver solution was considered to have a pH in the acidic range as defined in Applicant's specification. Applicant has submitted factual information showing that the solutions mentioned in the cited references would have a pH in the acidic range defined in Applicant's specification. The Examples in Applicant's specification, when compared to the Comparative Example 1, show unexpected results which clearly overcome any possible *prima facie* case of obviousness. The results shown in the Examples and Comparative Example in Applicant's specification are consistent also with the teaching away of Izaki et al., discussed *infra*.

For this first reason, any possible *prima facie* obviousness is overcome by Applicant's Examples, and the rejection of Applicant's claims over the asserted combination of Stevenson and Izaki et al. should be withdrawn. Applicant respectfully requests the Examiner to reconsider and withdraw the rejection of Applicant's claims, and to indicate the allowability thereof.

**There Is No Prima Facie Obviousness: Reliance Upon  
Izaki et al. Is Both Factually Incorrect and Legally Improper**

Applicants respectfully submit that reliance upon Izaki et al. is both incorrect factually and is improper legally, because Izaki et al. clearly teaches away from the presently disclosed and claimed invention. For this additional reason, Applicant respectfully submits the Examiner has failed to state a case of *prima facie* obviousness and the rejections, all of which are based on Izaki et al. as the secondary reference, should be withdrawn.

In considering references in the prior art, the Examiner is required to consider the teachings of the reference as a whole, see, e.g., *In re Boe*, 148 USPQ 507, 510 (CCPA

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1966) (all of the disclosures in a reference, including non-preferred embodiments, "must be evaluated for what they fairly teach one of ordinary skill in the art"). In the present case, the Examiner relied upon selected disclosures of Izaki et al., and ignored (or perhaps did not find) disclosures in Izaki et al. which clearly teach away from the presently claimed invention. Thus, the Examiner failed to consider the teachings of the reference as a whole.

The Examiner stated in the final Office Action:

Izaki et al. teaches the silver nitrate activating solution can be acidic and is aqueous, having a pH in the claimed range (Col. 5, lines 30-49, Example 1).

While this statement, standing alone, is correct, it is taken out of a context which clearly contradicts and refutes the Examiner's position with respect to the overall teachings of Izaki et al.

Throughout Izaki et al., it is clearly disclosed that two activators are required, a first activator including an aqueous solution of silver at a pH from 5-11, and a second activator including a solution of palladium. See, e.g., Izaki et al. at col. 5, lines 1-6. It is correct that Izaki et al. disclose an aqueous solution of silver at pH 5-11. It is not correct that Izaki et al. teaches that this aqueous silver solution can be used successfully as the activator in the absence of palladium. At col. 11, lines 27-32, Izaki et al. disclose Comparative Example 1, in which the aqueous silver solution is used as the activator in the absence of palladium. This activator is thereafter shown to give unacceptable, inferior results. See Table 1 (col. 11) (low density of catalyst, large particle size of catalyst, rough surface for Comparative Example 1); Table 2 (col. 12) (low density of catalyst, presence of defect in initial precipitation layer for Comparative Example 1 with electroless Cu and ZnO, no precipitation at all with Ni-P); Table 3 (col. 12) (poor adhesiveness to substrate with electroless Ni-P and Cu for Comparative Example 1). At col. 12, lines 34-35, Izaki et al. further disclose that with Comparative Example 1, the film was transparent but was colored into yellow.

Thus, there can be no doubt that Izaki et al. teach away from the use of an aqueous solution of silver at a pH from about 5 to about 10, in the absence of palladium, as the

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activator. See *In re Gurley*, 31 USPQ2d 1130, 1131 (Fed. Cir. 1994) (" [A] reference will teach away if it suggests that the line of development flowing from the reference's disclosures is unlikely to be productive of the result sought by the applicant.") Plainly, the teachings in Izaki et al. that silver in the absence of palladium does not provide the desired results, and that silver and palladium used together as activator does, not only would not suggest that it would be productive to use silver in the absence of palladium, but also would lead one away from using silver in the absence of palladium at a pH in the claimed range.

The Examiner's statement that:

The examiner is merely relying on the Izaki et al. reference to show the conventionality of using a silver nitrate bath that is acidic, aqueous, and having a pH in the claimed range for the activation of a plastic substrate for electroless deposition.

further shows that the Examiner failed to consider the teachings of this reference as a whole, since the above-quoted statement is an incorrect statement of the disclosure of the reference, as discussed above. The following disclosures of Izaki et al., *inter alia*, show that the portions of Izaki et al. relied upon have been taken out of context.

At col. 5, line 30, in the portion of Izaki et al. cited and relied upon by the Examiner, Izaki et al. teach that the silver solution is the first activator. At col. 5, line 56, immediately following the portion of Izaki et al. cited and relied upon by the Examiner, Izaki et al. teach that the palladium solution is the second activator. Thus, the disclosure immediately following that cited and relied upon by the Examiner directly contradicts the Examiner's statement and position, and shows that Izaki et al. not only fails to disclose or suggest use of silver as the activator in the absence of palladium, but also clearly teaches that the second activator containing palladium is required in order to obtain acceptable results in the subsequent electroless plating step.

At col. 6, lines 56-58, Izaki et al. reiterate that both silver and palladium are required:

According to the present invention, metal catalyst particles of silver and palladium can be made to adsorb, by the

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above catalyst nuclei formation treatment, on the non-conductive portion to be electroless-plated of the substrate....  
(Emphasis added.)

Here again, Izaki et al. clearly contradict the Examiner's statement and position.

As shown by the foregoing, based on the teachings of Izaki et al., a person of skill in the art would clearly understand that both silver and palladium are required for activation of a non-conductive surface for subsequent electroless plating. It is not proper for the Examiner to selectively apply the isolated, out-of-context teaching of a silver solution, when Izaki et al. clearly *requires* the use of both silver as the first activator and palladium as the second activator in order to obtain the desired results.

For at least the foregoing reasons, Applicant respectfully submits that the Examiner's reliance on Izaki et al. is clearly erroneous and cannot support a legally proper case of *prima facie* obviousness for the very simple reasons that Izaki et al. (1) teaches away from the claimed invention, and (2) does not teach the use of a silver nitrate solution as the activator in the absence of palladium as an additional activator prior to an electroless plating step, except in Comparative Example 1, which Izaki et al. discloses as giving unacceptable results. Thus, even though Izaki et al. teaches that it is possible to prepare a solution of silver nitrate at a pH in the range from 5 to 11, the other teachings in Izaki et al. would lead away from, not to, Applicant's claimed invention. As shown in the foregoing, Izaki et al. includes disclosure not cited or referred to by the Examiner which teaches away from the use of silver solution at a pH from about 5 to about 10 as activator in the absence of palladium.

For this second reason, the rejection of Applicant's claims over the asserted combination of Stevenson and Izaki et al. Applicant respectfully requests the Examiner to reconsider and withdraw the rejection of Applicant's claims, and to indicate the allowability thereof.

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For the either or both of the foregoing reasons, Applicant respectfully submits that the claims of the above-identified application patentably distinguish over the prior art, and that the application therefore is in condition for allowance. Applicant respectfully requests notice to such effect.

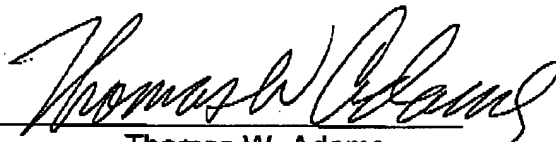
In the event issues remain in the prosecution of this application, Applicant requests that the Examiner telephone the undersigned attorney to expedite allowance of the application. Should a Petition for Extension of Time be necessary for the present Reply to the outstanding Office action to be timely filed (or if such a petition has been made and an additional extension is necessary) petition therefor is hereby made and, if any additional fees are required for the filing of this paper, the Commissioner is authorized to charge those fees to Deposit Account #18-0988, Docket No. ATOTP0100US.

Respectfully submitted,

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